The Prevalence of Speech and Language Impairment among a Nationally Representative Sample of Irish Children

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Speech and Language Impairment in Childhood

- Heterogeneous population (Broomfield & Dodd, 2004)

- World Health Organization (WHO, 1993), broad classification:
  
  - Receptive Language
  - Expressive Language
  - Speech
    - Processing
    - Understanding, interpreting & listening
    - Production
Impact of speech and language difficulties

Far reaching consequences...

- **Intrinsic to literacy development: spelling** (Snowling & Stackhouse, 1983; Leitao & Fletcher, 2004), **reading comprehension & accuracy** (Catts et al, 2008; Fraser & Conti-Ramsden, 2008)

- **Accessing school curriculum/ depressed academic achievement** (Nathan et al, 2004b; Snowling et al, 2011)

- **Managing behavior** (Lindsay et al, 2007; Botting & Conti-Ramsden, 2000)

- **Relating to peers** (Conti-Ramsden & Botting, 2004; Knox & Botting, 2003)
Prevalence

“The proportion or percentage of cases in a population at a specified time” Law, Boyle, Harris, Harkness & Nye (2000)

✧ Paramount in identifying margins between typical vs atypical development;

✧ Judging viability of current service provision to meet needs
(Mcleod & McKinnon, 2007; McKinnon et al, 2007)
Prevalence

- Considerable variability in literature - age group, methodology in data collection and criteria for determining impairment (Hull et al, 1971)

- Systematic review (Law et al, 2000) : 5.95% (range = 2.28 – 6.68%)

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>12.4%</td>
<td>6.34%</td>
<td>14.3%</td>
<td>1.51% (Speech impairment only)</td>
</tr>
</tbody>
</table>

- 5-18 years
- Teacher identification & Direct assessment

- 8 years
- Multiple source health and educational record review

- 5;4-6;10
- Direct assessment

- 5-12 years
- Teacher report & Direct assessment
McLeod & Harrison, (2009)


- Multiple sources:

<table>
<thead>
<tr>
<th>Teachers</th>
<th>Parental Concern</th>
<th>Direct Assessment (Adapted Peabody Picture Vocabulary Test)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expressive speech/language</td>
<td>22.3%</td>
<td>25.2% concerned for how child talks and makes speech sounds</td>
</tr>
<tr>
<td></td>
<td>“less/much less competent”</td>
<td></td>
</tr>
<tr>
<td>Receptive Language</td>
<td>16.9%*</td>
<td>9.5% concerned about child’s understanding</td>
</tr>
<tr>
<td>*strong relationship (medium-large effect size)</td>
<td></td>
<td>14.7%* more than one standard deviation below mean</td>
</tr>
</tbody>
</table>
✧ Brofenbrenner’s (1979) ecological model: need for context-specific information

✧ Ireland a unique context

✧ Need for a cogent evidence base in literature - do complementary trends exist in Australian vs. Irish data?
Research Aims…

1. Prevalence estimates according to three informants: primary caregivers, teachers, direct assessment

2. Rate of diagnosis

3. Proportion of children receiving in-school resources

4. Degree of correspondence between three primary informants
Methodology

• Primary caregiver main questionnaire:

Screener: “Do you have concerns about how your child talks and makes speech sounds?”
➢ Subtypes of impairment

Screener: “Do you think the Study Child has a Specific Learning Difficulty, Communication or Co-ordination Disorder?”
➢ Nature of difficulty (Speech & Language Difficulty)
➢ Received diagnosis?
Methodology

• Teacher-on-child questionnaire:

Ratings of academic performance in ‘oral communications’ and ‘comprehension’
Children “limited by speech impairment” & whether they receive in-school help/resources

• Drumcondra Test of Reading Vocabulary:

Reflect proficiency in oral speech and language, underlying links between word-reading and speech-sound knowledge (Hogan et al, 2005); and reading comprehension and expressive/receptive vocabulary (Wise et al, 2007)
➢ Logit scores
Data Analysis

1. Descriptive Analysis
2. Cross-tabulation: proportions
3. Chi-Square analysis: relationship between parent concerns and teacher ratings of speech/expressive language
4. One-way ANOVA tests of linearity: correspondence between parent/teachers and direct assessment
Findings…

- Prevalence according to parents…
  - 7.8% concerns (6.4% a little, 1.4% a lot)

Subtypes

- Speech not clear to others
- Difficulty finding words
- Difficulty putting words
- Lisps
- Voice sounds unusual
- Stutter, stammers
- Reluctant to speak
- Other

N = 8,568
Findings from primary caregiver reports...

확장된 영어 독해 및 언어 장애는 다른 특정 학습 장애/발달 장애와 비교한 결과:

- Other (기타)
- Autism (관구분)
- Dyspraxia (디스프라시아)
- ADHD (아드hd)
- Speech & Language Difficulty (말+언어 장애)
- Slow Progress (디스플레시아)
- Dyslexia (디스리키아)

N = 8,568

디스레시아가 2.2%였습니다.
Findings...

- Vast majority identified as having ‘Speech and Language Difficulty’ also reported receiving a professional diagnosis
- Nature of question- more clinical, contingent on professional opinion
- Smaller subset of children- different picture of prevalence

Table 7. Proportion of children reported by primary caregiver as having speech and language difficulties who were diagnosed by a professional (n=186) [N=8,568]

<table>
<thead>
<tr>
<th>Caregiver report of speech and language impairment</th>
<th>Caregiver report of diagnosis by professional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No/ Awaiting consultation</td>
</tr>
<tr>
<td>166 (89.2%)</td>
<td>20 (10.8%)</td>
</tr>
<tr>
<td>[1.9%]</td>
<td>[97.8%]</td>
</tr>
</tbody>
</table>
• **Time of diagnosis**

Table 8. Distribution of children with diagnosis of Speech and Language Difficulties according to time elapsed since diagnosis was received, based on Primary Caregiver report

<table>
<thead>
<tr>
<th>Caregiver report of Speech and Language Difficulty diagnosed by a professional</th>
<th>Last 6 months</th>
<th>6-12 months</th>
<th>1-2 years</th>
<th>Longer than 2 years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>22</td>
<td>11</td>
<td>19</td>
<td>114</td>
</tr>
<tr>
<td></td>
<td>(13.3%)</td>
<td>(6.6%)</td>
<td>(11.4%)</td>
<td>(68.4%)</td>
</tr>
</tbody>
</table>

**Question**

*How long ago was it diagnosed?*
Findings…

- Prevalence according to teacher report

**Comprehension**
- Below Average: 15.4%
- Average: 33.5%
- Above Average: 47.0%
- Missing: 1%

**Oral Communications**
- Below Average: 9.5%
- Average: 53.6%
- Above Average: 32.6%
- Missing: 0.7%

N= 8,568
Findings...

- Prevalence according to teacher report: Speech Impairment which limits activity in school.

Barriers to activity:

- Other: 2.0%
- Physical Disability/Visual/or...: 2.1%
- Speech Impairment: 2.3%
- Poor attendance: 2.6%
- Limited knowledge of main...: 3.1%
- Emotional or behavioral problems: 3.4%
- Discipline problems: 3.7%
- Home Environment/Problems at...: 6.4%
- Learning Disability: 10.0%
Findings...

- **Teacher report: proportion receiving in-school help/resources**
  - Majority identified as limited are receiving resources, however this is a much smaller subset of children than parents had concerns for...

Table 6. Proportion of children reported by teacher as having a speech impairment (which limits activity), who receive special help or resources in school. (n=196) [N = 8,568]

<table>
<thead>
<tr>
<th>Teacher report of whether child receives special help or resources in-school</th>
<th>Yes</th>
<th>No</th>
<th>Don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td>146</td>
<td>40</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>(74.5%)</td>
<td>(20.4%)</td>
<td>(5.1%)</td>
<td></td>
</tr>
<tr>
<td>[1.7%]</td>
<td>[0.4%]</td>
<td>[0.1%]</td>
<td></td>
</tr>
</tbody>
</table>

Teacher report of speech impairment which limits child’s activity
Findings...

- **Prevalence**: Normative scores, direct assessment (Drumcondra)

Table 7. Proportion of nine year olds with Logit scores below -1.5 and below -2 on the Drumcondra Test of Reading Vocabulary (N = 8,340).

<table>
<thead>
<tr>
<th>Logit score cut-off</th>
<th>Proportion of Nine-Year-Olds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Score less than -1.5</td>
<td>595 (6.9%)</td>
</tr>
<tr>
<td>Score less than -2</td>
<td>168 (2.0%)</td>
</tr>
</tbody>
</table>
Findings...

- Correspondance between parent and teacher reported prevalence (Speech + Expressive Language)
- Contingency table/Chi-square analysis -> significant relationship, medium-to-large effect size

Table 8. Correspondence between mother and teacher reports of speech and expressive language difficulties (weighted sample for children who received both mother and teacher ratings, N = 8190)

<table>
<thead>
<tr>
<th>General area of communication</th>
<th>Caregiver concerns about how child talks and makes speech sounds</th>
<th>Academic performance - oral communications</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Below average</td>
<td>Average</td>
</tr>
<tr>
<td>Speech and language (expressive)</td>
<td>Yes, a lot</td>
<td>64 (56.1%)</td>
</tr>
<tr>
<td></td>
<td>Yes, a little</td>
<td>138 (26.3%)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>608 (8.1%)</td>
</tr>
</tbody>
</table>

\[ \chi^2 (N=8190) = 480.225, p = < .001 \]
Findings...

- Correspondance between direct assessment and primary caregiver concerns
- Comparison of means with ANOVA tests of linearity

- Significant relationship - $F(2, 8330) = 81.484, p < 0.1$
- However, closer inspection: only small-to-medium effect size generated, $\eta^2 = 0.02$
Findings...

- Correspondence between teacher ratings and direct assessment
  - Significant relationship evinced, with larger F value than obtained for primary caregivers, $F(2, 7994) = 1039.499$, $p < 0.1$
  - Effect size similarly larger, $\eta^2 = 0.2$, a large effect
Conclusions...

- In addition, significant relationships were evinced between all three.

  - Mother’s concern (7.8%)
  - Teacher ratings (9.5%)
  - Direct Ax Cut-off - 1.5 (6.9%)

Similar prevalence rates
- Lower than findings of Harrison & McLeod (2009) – 25.2% parental concerns, 22.3% teacher ratings
- Nonetheless, higher than median rating for prevalence (5.95%)
- Decreasing prevalence with age? – Results from Scotland (GUS) lend weight to this

<table>
<thead>
<tr>
<th>Prevalence</th>
<th>GUI</th>
<th>LSAC</th>
<th>GUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caregiver report</td>
<td>7.8%</td>
<td>16.8%</td>
<td>15.6%</td>
</tr>
<tr>
<td>“Concerns about how child talks and makes speech sounds”</td>
<td>14% (girls)</td>
<td>21% (boys)</td>
<td>12% (girls)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age (years; months)</th>
<th>9</th>
<th>2;10</th>
<th>4;3-5;7</th>
<th>6;10</th>
<th>3;0-4;0</th>
<th>5;0-6;0</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Taylor, Maguire, &amp; Zubrick, 2011)</td>
<td></td>
<td>(McLeod &amp; Harrison, 2009)</td>
<td>(Taylor et al., 2011)</td>
<td>(Barnes, Chanfreau, &amp; Tomaszewski, 2010)</td>
<td>(Barnes et al., 2010)</td>
<td></td>
</tr>
</tbody>
</table>
Conclusions

• Middle childhood largely overlooked in literature, however despite a general decline in prevalence with age a high prevalence still pertains to this age group.

• Also some children were only diagnosed within the last 1-2 years: increasing linguistic demands (Lindsay et al, 2001)

➤ Suggests importance of continuing intervention for this age-group – difficulties that persist past 6 years, particularly vulnerable & “require specialist language-learning opportunities” (McCartney, Boyle et al, 2011)

However...
Conclusions

• More circumscribed picture of prevalence based on rate of diagnosis (1.9%), receipt of in-school resources/services (1.7%) and more stringent criteria of -2 s.d. below mean on direct assessment...

• This may reflect factors inherent in service delivery – diagnostic criterion

• Points to a need to use standardized testing in conjunction with functional indices of impairment (Bishop & MacDonald, 2008; IASLT, 2007)
Further Research

• Parent report only available for speech & expressive language

• However, teachers identified a higher proportion of children with receptive difficulties than expressive (15.4%; 9.5%) - Opposite in McLeod & Harrison (2009) (9.5%; 25.2%)

• May reflect pervasiveness of receptive difficulties (Law et al, 1998; Beitchman, 1994)

• Previous studies have stated that teachers are reliable judges of comprehension/listening difficulties (Gilmore & Vance, 2007), however research only carried out on younger children
Thank you!

Questions?